

## Site Need Statement

General Reference Information	
1 *	<b>Need Title:</b> Tank Farm Weather Enclosure
2 *	<b>Need Code:</b> RL-WT114
3 *	<b>Need Summary:</b> Construction and Maintenance tasks supporting both waste safe storage and waste retrieval are performed in the Hanford Tank Farms in contaminated pits where equipment such as valves, pumps, and interconnection pipes are located. Performance of these tasks frequently requires the erection of tents or green houses to control contamination. However, these structures do not provide a complete barrier to adverse weather conditions, such as high wind and rain. Construction work is regularly interrupted by such conditions due to the potential for wind-borne contamination spread and for industrial safety reasons. Installation of an enclosure over the work areas would reduce the environmental and worker risk, and the schedule and cost impacts of construction downtime associated with adverse weather conditions.
4 *	<b>Origination Date:</b> November 2001
5 *	<b>Need Type:</b> Technology Need
6	<b>Operation Office:</b> Office of River Protection (ORP)
7	<b>Geographic Site Name:</b> Hanford Site
8 *	<b>Project:</b> Safe Storage and Retrieval                      PBS No: RL-TW03, RL-TW04
9 *	<b>National Priority:</b> 1. <u>High</u> - Critical to the success of the EM program, and a solution is required to achieve the current planned cost and schedule. X 2. <u>Medium</u> - Provides substantial benefit to EM program projects (e.g., moderate to high life-cycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays). 3. <u>Low</u> - Provides opportunities for significant, but lower cost savings or risk reduction, may reduce the uncertainty in EM program project success.
10	<b>Operations Office Priority:</b>
Problem Description Information	
11	<b>Operations Office Program Description:</b> The overall purpose of the safe-storage function is to operate and maintain the double shell tank (DST) and single shell tank (SST) farms in a safe and compliant manner until the contained wastes are retrieved and the tank farms are ready for closure. This includes performing day-to-day operations, maintaining and upgrading infrastructure, resolving safety issues, assessing tank integrity, characterizing the waste, and managing the DST waste inventory. This function also includes interim stabilization of selected SSTs. The end state of safe storage is containment of DST and SST tank wastes in a manner that supports safe waste retrieval for final waste disposal; tank-farm structures, including DSTs and SSTs, ready for final disposal and closure; and tank farms amenable and ready for the mitigation of any environmental releases that occurred during storage and retrieval of tank waste.  The overall purpose of the Retrieve and Transfer SST Waste function is to move the waste from the SSTs into preferred storage in the DST system. A primary objective of this function is to develop and test alternative and improved retrieval technologies to past-practice sluicing. As part of this effort Leak Detection Monitoring and Mitigation (LDMM) approaches are being developed for concurrent deployment. To support this effort Cold Test Training & Mock-up Facilities are being established. The baseline end state of the Retrieve and Transfer SST Waste function is: <ul style="list-style-type: none"> <li>• Retrieval of all wastes from the SSTs</li> <li>• The safe, environmentally compliant transfer of this waste to the SSTs</li> <li>• SSTs in a ready state for implementing closure and final disposal of the SST farms.</li> </ul>
12	<b>Need/Problem Description:</b> Current safe storage operations at the Hanford Tank Farms involve waste transfers that require use of Double-Shell Tank and Single-Shell Tank pits. Safe Storage also requires pit upgrades for environmental regulation

	<p>compliance. In addition, upgrades to the Tank Farms transfer system pits are required to support future retrieval of the waste and delivery to the Waste Treatment Plant. Examples of these ongoing and future pit activities are removal and replacement of jumpers, piping connection modifications, installation of instrumentation and hardware (pumps, etc), and decontamination of pits. Enclosures have been used at nuclear sites in the DOE complex and internationally, to shelter field operations while ensuring weather protection and adequate working temperatures. Enclosures have ranged from relatively large sized and permanent, to smaller sized and moveable. Two main types of design have been used: fabric-based, and metallic structures.</p> <p>Implementation in the Hanford Tank Farms involves specific issues, such as dome loading limitations, or interference with permanent above ground devices, and vehicles and crane circulation. Another technical issue is to minimize the air in-leakage into the enclosure, so as to allow for efficient dynamic containment (ventilation).</p> <p><b>Program Baseline Summary (PBS) No.:</b> TW03, TW04</p> <p><b>** Work Breakdown Structure (WBS) No.:</b> 5.01.02.04, 5.01.03.04, 5.02.01.01.32, 5.02.02.02.0 (W-211), 5.02.02.03.01 (W-314)</p> <p><b>** TIP No.:</b> This need will continue for as long as pit work is performed. Tank Farm Operations would benefit from a deployment at any time during the Tank Farm mission.</p>
13	<b>Functional Performance Requirements:</b>
**	<b>Schedule Requirements:</b>
14	<b>Definition of Solution:</b> Several concepts could be considered, from a mobile small size enclosure (to cover one pit at a time), to a fixed large size enclosure (to cover a whole tank, or a whole tank farm). A recent study concluded that the most promising concept for a first time implementation at this time is the mobile pit-size enclosure. An Accelerated Site Technology Deployment Proposal is being prepared for this first deployment.
15 *	<b>Targeted Focus Area:</b> Tanks Focus Area (TFA)
16	<b>Potential Benefits:</b>
17 *	<b>Potential Cost Savings:</b> \$ 1M to \$10M
18 *	<b>Potential Cost Savings Narrative:</b> Cost benefits will come primarily from not having to build new tents repeatedly (some tents are not used more than once today), and from reduced weather downtime. The first deployment proposed will lead to an estimated cost saving of \$1M.
**	<b>Technical Basis:</b> Enclosures have been used at nuclear sites in the DOE complex and internationally, to shelter field operations while ensuring weather protection and adequate working temperatures. However, implementation in the Hanford Tank Farms involves specific issues, such as dome loading limitations, or interference with permanent above ground devices, and vehicles and crane circulation. Another technical issue is to minimize the air in-leakage into the enclosure, so as to allow for efficient dynamic containment (ventilation).
19	<b>Cultural/Stakeholder Basis:</b>
20	<b>Environment, Safety, and Health Basis:</b> The weather Enclosure will improve working conditions for pit work, and reduce contamination risk for both workers and the environment.
21	<b>Regulatory Drivers:</b>
22 *	<b>Milestones:</b> This technology will reduce cost and schedule risk for all milestones involving pit work.
23 *	<b>Material Streams:</b> Sludge, salt, liquid (RL-HLW-20)
24	<b>TSD System:</b> Single Shell Tank systems
25	<b>Major Contaminants:</b> Pu-238, 239, 240, 241; AM-241; U-238; C-14; Ni-59/63; Nb-94; Tc-99; I-129; Cm-242; Sr-90; Cs-137; Sn-126; Se-79; chromium; nitrate; nitrite; complexants (EDTA/HEDTA)
26	<b>Contaminated Media:</b> Tank waste consisting of high molarity sodium hydroxide/sodium nitrate solution containing saturated saltcake and/or sludge.

27	<b>Volume/Size of Contaminated Media:</b> The single shell tanks are generally 75 ft. in diameter, and up to 40 feet deep with their tops buried about 10 feet below the ground surface.
28 *	<b>Earliest Date Required:</b> FY 2002
29 *	<b>Latest Date Required:</b> Post 2020
<b>Baseline Technology Information</b>	
30	<b>Baseline Technology(ies)/Process:</b>  <b>Technology Insertion Point:</b> This need will continue for as long as pit work is performed. Tank Farm Operations would benefit from a deployment at any time during the Tank Farm mission.
31	<b>Life-Cycle Cost Using Baseline:</b>
32	<b>Uncertainty on Baseline Life-Cycle Cost:</b>
33	<b>Completion Date Using Baseline:</b>
<b>Points of Contact (POC)</b>	
34	<b>Contractor End User POCs:</b> Tarik Choho, NHC/CHG, 509-376-0590, F/509-372-2403, <a href="mailto:Tarik_Cchoho@rl.gov">Tarik_Cchoho@rl.gov</a>
35	<b>DOE End User POCs:</b>
36**	<b>Other Contacts:</b> K.A. (Ken) Gasper, CHG, 509-373-1948, F/509-376-1788, <a href="mailto:Kenneth_A_Ken_Gasper@rl.gov">Kenneth_A_Ken_Gasper@rl.gov</a>

\*Element of a Site Need Statement appearing in IPABS-IS

\*\*Element of a Site Need Statement required by CHG